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Evaluation of Clinical Laboratory Performance as a Procuring Agency	
Muhammad Shoaib Akhtar ^{1*} , Taslim Rubab ¹ and Ummair Mehmood ¹	
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1. District Headquarter Hospital Chakwal, Pakistan *Correspondence: xaib@ymail.com	How to cite this: Akhtar, M.S., Rubab, T. and Mehmood, U. 2019. Evaluation of Clinical Laboratory Performance as a Procuring Agency. Int J Front Sci, 3(2), 108-109.
Abbreviations: CV=Coefficient of Variation DHQ=District Headquarter Hospital	

Background:

Primary and Secondary Healthcare Department of Punjab, Pakistan has outsourced its clinical laboratory services at various secondary level hospitals in the province. (1) Methodology adapted to outsource these facilities was based on phasing out the process. While methodology adapted to selection of service provider was on the basis of bidding. (2) Two service providers contracted the procuring agency to deliver services to general public. In the first phase, clinical laboratory services of DHQ Hospital Chakwal were outsourced to a private laboratory service of the country. This communication aims on the methods adopted by Pathology Department of the hospital to evaluate the technical efficiency of the service.

Description of Methods:

Procuring agency and service provider mutually developed a proficiency testing plan (2) and agreed upon following methods to evaluate technical efficiency:

1. A representative (appointed medical laboratory technologist) is responsible to collect 2.5X samples randomly per 1000 tests performed per each parameter tested.
2. He will also collect the results of the tests as reported to the patient.

3. Samples collected will be sent to two best known laboratories based on their quality management systems on a double-blind methodology.
4. Results of all three laboratories will be analysed to deduct how much varied they are.
5. Based on the variation, procuring agency will charge a penalty on the service provider.

Criteria for the selection of external laboratories: Two Joint Commission International accredited laboratories offering its services countrywide were selected.

Double blinding of the samples: The procuring agency representative use to double blind the randomly selected samples. For this purpose, a unique identifier code is added to each sample. Record of this is maintained by procuring agency.

Statistical approach to calculate dispersion: A relative measure approach is used to measure the dispersion in results. Coefficient of variation (CV) between service provider and both laboratory results is chosen. Coefficient of variation or relative standard deviation is one of the best known choices for measuring relative dispersion in such cases. (3) Two CVs (CV₁ and CV₂) are used to calculate for each

parameter and both external laboratory results separately as per following formulas:

$$CV = \frac{SD}{\bar{X}} \times 100$$

Where SD was calculated between reported results of service providing laboratory and first or second external laboratory using the following formula:

$$SD = \sqrt{\frac{\sum(X - \bar{X})^2}{2}}$$

And $\bar{X}$ was calculated between results reported by service providing laboratory and first or second external laboratory using the following formula:

$$\bar{X} = \frac{\text{Service Provider Result} + \text{External Laboratory Result}}{2}$$

Following table was being used to report CV:

Parameter Name: Example Data			Statistics
Sample Identifier	Service Provider Lab	Lab Result	10
	External Lab 1	Lab Result (1)	10.01
		Mean (1)	10.01
		SD ₁	0.01
		CV ₁ (%)	0.07
	External Lab 2	Lab Result (2)	10.3
		Mean (2)	10.15
		SD ₂	0.21
		CV ₂ (%)	2.09

Penalty: A penalty system is implemented on all parameters if CV is reported to be more than 15% for any parameter based on both external laboratory results.

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